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## Lung transplantation for COVID-19-associated ARDS

We read with great interest the study in *The Lancet Respiratory Medicine* by Ankit Bharat and colleagues<sup>1</sup> that reported the favourable outcomes of 12 patients who underwent lung transplantation for unresolving acute respiratory distress syndrome (ARDS) secondary to COVID-19.<sup>1</sup> The lung transplantation teams, critical care physicians, and surgeons who initiated and performed the lung transplantation in such hazardous conditions should be commended for these excellent results. The authors conclude that “lung transplantation is the only option for survival in some patients with severe, unresolving COVID-19-associated ARDS.” However, they did not provide any definition of unresolving ARDS to support this conclusion.

In this study,<sup>1</sup> the 12 patients deemed to have irreversible lung damage were listed for lung transplantation a median of 69 days (IQR 51–82) after the onset of COVID-19. All patients but one had been receiving extracorporeal membrane oxygenation (ECMO) support for a median of 49 days (IQR 38–80) at the time of lung transplantation. The authors assumed that after such prolonged ECMO support, the patients’ native

lungs would never recover adequate function. Conversely, in 83 patients from Sorbonne University, France, who were assisted with ECMO for COVID-19-associated ARDS,<sup>2</sup> 12 received ECMO for 50 days or more. None of these patients underwent lung transplantation, and six (50%) of these 12 patients were alive and weaned from ECMO after 90 days. Whether the other six (50%) patients who did not survive would have been rescued by lung transplantation is questionable. These data suggest that despite prolonged COVID-19-associated ARDS and ECMO support up to 50 days, lung parenchyma can still recover. Furthermore, in the setting of prolonged ARDS, high-dose methylprednisolone has been shown to improve lung injury and reduce mortality.<sup>3</sup> As eight of 12 patients in Bharat and colleagues’ study received corticosteroids, it would be of great interest for the authors to provide the timing and dosage of infusion.

Considering these data, we think that, albeit feasible, lung transplantation should be carefully weighed in the setting of prolonged COVID-19-related ARDS. Among the ten criteria suggested by Cypel and Keshavjee<sup>4</sup> to assess lung transplantation candidates in this difficult condition, the healing potential of lung parenchyma should not be underestimated, even after 50 days of ECMO support. Further

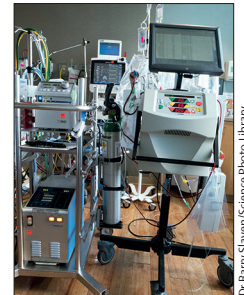
research is needed to better predict whether lung improvement might be expected after such a long ECMO run and prolonged mechanical ventilation support.

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- 4 Cypel M, Keshavjee S. When to consider lung transplantation for COVID-19. *Lancet Respir Med* 2020; **8**: 944–46.



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